INTERNATIONAL BAUXITE ASSOCIATION
ASSOCIATION INTERNATIONALE DE LA BAUXITE

THE CURRENT STATE OF THE BAUXITE/ALUMINA/ALUMINIUM INDUSTRY AND SHORT-TERM MARKET OUTLOOK

(Prepared by IBA Secretariat for UNCTAD Meeting of Bauxite Producers and Consumers

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TABLE OF CONTENTS

		Page
	ABSTRACT	3
I.	INTRODUCTION	4
II.	INTERNATIONAL DEVELOPMENTS	5
	II.1 Economic Outlook	
	II.2 Oil Prices	
III.	THE STATE OF THE PRIMARY ALUMINIUM MARKET	11
	III.1 Supply/Demand Balance	
	III.2 Consumption	
	III.3 Production	
	III.4 Stocks	
	III.5 Prices	
	III.6 Costs of Production	
IV.	THE STATE OF THE ALUMINA MARKET	23
	IV.1 Introduction	
	IV.2 Production of Alumina	
	IV.3 Stocks of Alumina	
	IV.4 Operating Costs	
	IV.5 Prices	
V.	THE STATE OF THE BAUXITE MARKET	32
	V.1 Recent Developments	
	V.2 Production	
	V.3 Prices	
VI.	SHORT-TERM FORECASTS	38
	VI.1 Primary Aluminium	
	VI.1 Primary Aluminium	
	VI.2 Metallurgical Grade Alumina (MGA)	
	VI.3 Bauxite	

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ABSTRACT

Due to the supply/demand imbalance for primary aluminium, the market softened during the second half of last year and prices declined. Demand was lower than expected because of the recessionary circumstances in the U.S.A. and U.K. and due to the many economic/political uncertainties surrounding the Gulf Crisis.

The end of the Gulf War has not improved the position of the metal since the U.S. and U.K. are still in recession. Prices have remained low at 70-71 c/lb and are not expected to improve much during the year, due to the additions to world smelting capacity. The current cost/price ratio is not very favourable, and costs in some major metal producing countries such as the U.S.A. could go up in the near future, due to the strict enforcement of certain environmental regulations. Stocks in day's consumption are high. If the economic situation improves, 1992 should be a better year for the industry.

The alumina market is currently also quite soft due to an over-supply situation and increasing stocks. The spot price has declined to around US$195-200/tonne and is likely to remain at those levels for the rest of the year. Some improvement of the market is expected by next year as the demand for primary aluminium takes off.

The market for traded bauxite is currently in better shape than that for alumina. However, due to additional output from Brazil, Venezuela and Guyana during the year, the bauxite market could become softer by the end of this year, and remain in that position during 1992 as well.

The general consensus in the industry is one of a bearish outlook for the rest of the current year and part of 1992. Substantial improvements are expected as of 1993.

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I. INTRODUCTION

This document contains an analysis of the current situation of the world bauxite/alumina/aluminium industry and provides a short term market outlook as envisaged by the Secretariat of the International Bauxite Association.

The paper starts with a brief overview of international developments, as the industry, being a part of the world economy is directly influenced by international macro-economic developments. This economic overview is followed by a systematic analysis of the market situation of primary aluminium, focussing attention on issues such as consumption, production, stock movements, prices, costs of production etc. In ensuing chapters, the market situation of alumina and bauxite is presented more or less along similar lines.

Finally, we present a short-term outlook scenario for the three stages of the industry.

II. INTERNATIONAL DEVELOPMENTS

II.1 Economic Outlook

Since late last year, the economies of at least four major OECD countries, i.e. U.S.A., U.K., Canada and Australia have been experiencing substantial difficulties. These economies, and in particular the first two, are currently in a clear state of recession. While there are some conflicting views about the severity and extent of the current recession, the IBA Secretariat concurs with those who argue that this downturn is primarily of a cyclical nature and that signs of economic recovery are likely to start showing by the second half of the current year. Given the recent pursuit of appropriate monetary policies and the exercise of fiscal discipline by the major OECD economies, such an outlook seems quite reasonable.

In the Secretariat's view therefore, the latest short-term economic growth forecasts published by Consensus Economics seem quite realistic at this stage (1). These forecasts along with pre-Gulf war forecasts made by the OECD are set out in table 1.

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(1) Forecasts based on the averages of 170 independent analysts published in "The Economist", January 26, 1991

Table 1

Forecasts of Real GNP/GDP Growth Rates 1990, 1991 and 1992

(% change from previous year)

Country	Forecast by Consensus Economics published January 1991		OECD Forecast published December 1990		
	1991	1992	1990	1991	1992
USA	-0.4	2.5	1.0	0.9	1.9
Japan	3.6	3.8	6.1	3.7	3.8
Germany	3.0	2.9	4.2	3.0	2.6
France	2.4	2.6	2.5	2.3	2.6
Italy	1.8	2.6	2.6	2.4	2.7
U.K.	-0.2	2.1	1.6	0.7	1.9
Canada	-0.4	2.9	1.1	0.9	2.3
Australia	1.0	2.7	2.2	2.3	2.3
Belgium	2.6	2.7	3.5	2.3	2.6
Netherlands	2.4	2.7	3.0	2.0	2.3
Spain	2.7	3.4	3.5	2.7	3.0
Sweden	-0.2	1.3	0.9	-0.5	0.8
Switzerland	2.1	2.3	2.5	2.0	1.8

Source: The Economist, January 16, 1991 and
OECD Economic Outlook, No. 48, December 1990

The table suggests that the U.S.A., U.K. and Canada which are currently in a state of recession will grow out of this situation by the end of the year and should experience relatively healthy growth rates in 1992. The economies of other major OECD countries such as Japan, Germany, France, while experiencing a decline in their respective growth rates compared to the situation in previous years, continue to be in good shape and should remain healthy.

The state of the U.S. economy is of particular interest to us, since the U.S. is the largest single market for aluminium products. The current recession is being reflected in a notable drop in US aluminium consumption. The hardest hit are the automobile and the housing sectors, two main consumers of the metal (1). Also of interest is the position of the U.S. dollar vis-á-vis the other major currencies in the world. It may be noted that the current weak U.S. dollar is contributing to inflationary pressures in the U.S.A., but has improved the competitiveness of U.S. products abroad and has served to boost U.S. exports including exports of aluminium mill products.

I.2 Oil Prices

The invasion of Kuwait by Iraqi forces in August last year resulted in a temporary steep rise of oil prices on the world markets, reaching levels of around US$40 per barrel. This price upsurge was not supported by market fundamentals, but was the effect of psychological factors influencing the market. Loss of output from Iraq and Kuwait was filled quite swiftly with increases from other oil producers, notably Saudi Arabia, where production was boosted from 5.3 million barrels per day (mbd) to a massive 8.5 mbd by December of last year.

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(1) According to the World Bank, residential construction in the U.S.A. will decline by 7.6% in the current year, but should rise by 9.8% during 1992.

This massive increase in output along with the existence of high oil stocks in the main consuming countries and in floating storage, the release of strategic stock reserves by IEA member countries, several measures to cut oil demand, and the impact of lower economic growth rates on oil requirements have resulted in a notable drop in the price of crude oil on all world markets. The end of the Gulf war has served to put additional pressure on the price of crude oil.

While industry observers think that it may take Kuwait as long as two years or longer to repair its burning oil wells, this country's production could reach some 250,000 to 400,000 barrels per day by the end of the year while Iraq could also start exporting some crude around that time, provided it gets access to its outlet pipelines which are now controlled by allied forces.

Oil prices should therefore remain under pressure during this year with estimates of the average price ranging between a low of US$17 per barrel to an upper level of US$20 per barrel.

However, if by next year production in Saudi Arabia remains at 8.5 mbd and the majority of oil wells in Kuwait and Iraq are brought to life again, then one can see prices dropping even further due to an expected glut of oil. Prices could drop to lower than US$14 per barrel on the basis of the expected

market fundamentals but may not be allowed to remain at that level for long. The expectation is that politically such a low price will not be acceptable to either the producers of crude, or the consumers (1) . Thus, it is expected that all efforts will be made by OPEC and consuming governments to stabilize the price near to US$20 per barrel in 1992 as well, with current forecasts ranging between US$18-$19 per barrel for the year (2). This analysis suggests that the oil market will be a very controlled one for the months to come, and that prices in general should hover between US$17-US$20 per barrel during the coming 18 to 20 months.

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(1) Erratic movements of oil prices affect the economic stability of consuming countries, while some major consuming nations partly supplied from indigenous sources would not want to jeopardize the viability of their own operations.

(2) At its first post-Gulf war meeting held on March 11-12 the OPEC explored possibilities to cut daily crude output by at least 1 million barrels. The market saw in this clear signs of the organization's viability. Consequently, upon this announcement, the North Sea Brent price rose by US$1 per barrel to US$19.50. Analysts indicated that the interest of the largest OPEC producer Saudi Arabia is not served by too high crude prices because:

    (1) Saudi Arabia does not want to encourage new entrants to the oil market;
    (2) that nation's foreign industry investments benefit from relatively low and stable crude prices

Such price outlook for crude oil should be some consolation to alumina producers, expected to operate in a soft market during the coming months, since Bunker C prices should be at favourable levels for this stage of the industry. This price outlook for crude oil should also serve to support a more meaningful recovery of economies worldwide and in the OECD countries in particular (1).

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(1) According to the OECD, every $3 per barrel fall in oil prices leads to a ¼% p.a. increase in real GNP in the OECD countries

III. THE STATE OF THE PRIMARY ALUMINIUM MARKET

III.1 Supply/Demand Balance

During 1990, western world primary aluminium production was some 40 kt* short on total demand. However, imports from Eastern European countries exceeded this amount by around 100 kt, causing a slight over-supply situation for the year. Most of this excess supply seems to have occurred during the fourth quarter of last year, when western world production continued to increase, while demand stagnated, due mainly to the recessionary environment in the U.S.A. and U.K. and because of the uncertainties surrounding the Gulf crisis at that time. There are ample reasons to believe that the over-supply situation will not abate during at least the first two quarters of the current year.

III.2 Consumption

As can be gleaned from table 2, consumption of primary aluminium during 1990 was marginally higher than in 1989. This almost stagnant consumption level came about mainly because of the economic difficulties in some of the major aluminium consuming countries and the previously mentioned uncertainties related to the military crisis in the Gulf since the third quarter last year.

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*Kt = Kilotonnes or 1000 tonnes

Because of these problems, consumers of the metal adopted a "wait and see" attitude, with order bookings plunging during the fourth quarter of last year.

Overall, the market was in a bearish mood at the start of the new year and the outbreak of the Gulf war had further aggravated market sentiments. At least for the time being, demand is expected to remain sluggish despite the ending of the war. Consumption should recover later in the year, assuming that the post-war period continues to be characterized by relatively low oil prices and signs of worldwide economic recovery later in the year.

Right now, the main consuming country, i.e. the U.S.A. is in recession. The country's automobile and construction industries - albeit not major consumers of primary aluminium - are in the doldrums and likely to stay there for the months to come (1). Most of the U.S.A.'s excess metal supply is being exported to Japan where demand continues to be strong. These exports - supported by the weak U.S. dollar - have been a welcome outlet for U.S. producers under the current weak national market conditions.

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(1) The average aluminium content of U.S. automobiles has increased from 130 lbs in 1980 to an estimated 165 lbs in 1991. Some 85% of this is secondary material

Table 2

Estimated Western World Supply/Demand Balance of Primary Aluminium 1989/1990 (kt)

	1989	1990	% change	Jan. 1991
Demand (real consumption)				
U.S.A.	4360	4293	- 1.5	356
Japan	2158	2290	+ 6.1	197
France	686	686	+ 0.0	62
Germany	1290	1304	+ 1.1	130
Italy	607	624	+ 2.8	56
U.K.	455	447	- 1.8	39
Others	5061	4989	- 1.4	430
Total Demand	14617	14630	+ 0.09	1270
Supply				
Production				
U.S.A.	4025	4054	+ 0.7	351
Canada	1562	1563	+ 0.1	140
Europe	3948	3926	- 0.6	325
Oceania	1501	1498	- 0.2	126
Latin America	1698	1782	+ 4.9	163
Others	1730	1775	+ 2.6	157
Total Production	14464	14598	+ 0.9	1262
Net Imports	184	143		24
Total supply	14648	14741	+ 0.6	1286

Source: CRU and IBA estimates

III.3 Production

Output at the smelting stage of the industry has continued to grow, despite indications of weaker demand. For the fourth quarter in 1990, production is estimated to have increased by 1.8% to 3734 kt compared to third quarter output (1).

The IBA Secretariat estimates that some 500 kty of brownfield, greenfield and restarted capacities were added during the last quarter of 1990. This additional capacity was not fully utilized during the start-up period but should reach a high utilization rate during the first half of the current year. During this same period, an additional 290 kty* capacity is expected to come on stream. The few closures and cutbacks which have taken place during the period, total 115 kty. No other cutbacks are envisaged for now. From this analysis, it is quite clear that western world output will continue to increase for the months to come. Thus, while demand continues to be stagnant, production is high and increasing. Stock levels are therefore expected to rise. The only consolation is that net exports from the traditional Eastern European suppliers to the western world are not expected to increase much in the short term due to the many technical difficulties being faced by the industry in these countries.

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(1) Fourth quarter 1990 western world output was up 3.1% from a year ago compared to an increase in consumption by just 0.5%

* = Kilotonnes per year

III.4 Stock Movements

Latest data indicate that producers' stocks have increased by some 130 kt during Q4 1990 while LME stocks rose around 180 kt over the same period. By the end of January, producers' stocks amounted to 1564 kt compared to 1539 kt by the end of December while LME stocks had come down to 301.15 kt over the same period, a modest decline from the 310.6 kt recorded at the end of last year. This 9.45 kt decline in LME stocks came about due to increased Japanese buying by end January combined with some short covering by traders.

As indicated in table 3, producers' stocks stood at 39.5 days consumption by end-December last year, still lower than the result a year before. Stocks are expected to reach 43.3 days consumption by the end of the first quarter and 48.3 days by end of Q2.

Industry analysts now think that a stock level at 40 days' consumption should be considered close to a "normal" level in today's industry environment with its highly computerized stock management features.

The IBA Secretariat's estimates therefore suggest that primary stocks will be substantially higher during the first two quarters of this year compared to what is now considered as "normal" levels.

Table 3

Consumption and Producers' Inventory of Aluminium 1989-1991
(kt at end of quarter)

	Consumption	Producers' Stocks (at end of quarter)	Days Stocks (1)
1989 Q1	3656	1515	37.8
Q2	3732	1510	36.9
Q3	3684	1592	39.4
Q4	3545	1576	40.6
1990 Q1	3631	1552	39.0
Q2	3706	1485	36.6
Q3	3737	1409	34.4
Q4	3556	1539	39.5
1991 Q1(E)	3560	1690	43.3
Q2(E)	3570	1890	48.3

Note - (1): Producers include smelters and integrated semi-fabricators. Days stocks are calculated as stocks at end of quarter/ consumption per day

(E): IBA estimate

Source: IPAI, CRU, IBA

III.5 Prices

The slight over-supply situation on the primary aluminium market has clearly placed downward pressure on the metal price since the latter part of last year, with the LME cash

price dropping from an average of 93.7 c/lb* in September 1990 to just over 69 c/lb in December. Due to additional supply of metal in LME warehouses and low buyers' activity on the terminal market at the start of the new year, prices remained depressed with the LME cash price averaging 68.7 c/lb in January and falling marginally to 68.3 c/lb in February (see Table 4). Although the overall market fundamentals are not the only factors determining price movements on the terminal market, i.e. the LME, it is generally accepted that these movements are reasonable indications of the status of the supply/demand situation in the industry (1).

During the Gulf war, consumer confidence was quite subdued and placement of new orders was very low. The post-war period has not shown any renewed enthusiasm by consumers of the metal apart from some new orders being placed by Japanese offtakers. Thus industry observers see fundamentals as relatively weak and expect the price to remain around 69 c/lb for the time being, while a temporary drop of the LME cash price to below 65 c/lb is not being ruled out.

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(1) It may be noted that from a seller's point of view, the LME offers several hedging tools against possible price declines of the metal and its raw material. In this connection, it is interesting to know that the total turnover of aluminium on the LME amounted to an excess of 99 million tonnes in 1990.

*C/lb = US cents per pound

Under the current market conditions, the major North American companies have lowered their March delivery prices for ingot to 71 c/lb, down 0.5 c/lb from January delivery prices. One quite interesting development is the decision by Alcan to allow its customers to choose between two different ingot prices for March and April offtakes. In addition to the company's transaction price, customers can opt to pay for offtakes at the monthly average of the Metals Week U.S. Transaction price, a month prior to the month of shipment. Some industry observers feel that this move towards market-based pricing can be a significant and long-lasting deviation from traditional company transaction pricing methods.

TABLE 4

LME CASH PRICE FOR PRIMARY ALUMINIUM INGOT
(US CENTS/LB.) (1)

End of month	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
January	85.82	65.67	50.44	48.89	70.22	48.78	50.77	53.12	91.3	109.75	69.32	68.73
February	98.89	65.88	54.71	55.84	68.72	49.81	50.60	58.22	98.3	99.40	65.97	68.25
March	87.73	65.27	48.08	59.01	67.72	49.68	52.98	62.00	114.6	94.06	71.10	
April	89.36	64.30	45.04	61.62	64.27	50.18	52.82	63.55	113.9	96.42	69.20	
May	81.19	59.08	43.41	65.85	59.19	50.18	52.84	64.03	137.0	102.43	69.26	
June	82.10	56.29	41.32	67.09	57.04	46.82	53.66	66.70	164.9	86.83	71.03	
July	78.36	52.39	43.44	67.18	52.07	45.92	50.94	74.89	117.1	79.65	71.26	
August	81.39	55.25	43.48	70.67	52.73	46.19	51.22	82.12	122.5	81.16	80.83	
September	77.09	53.21	43.13	73.76	45.80	44.60	54.70	79.21	108.3	77.93	93.74	
October	73.94	51.80	43.13	73.76	45.80	44.60	54.70	89.03	104.8	82.56	88.26	
November	71.10	48.49	43.92	69.63	52.25	43.10	51.34	76.25	103.5	78.75	73.40	
December	65.09	50.44	44.70	71.26	49.68	47.20	51.02	82.70	103.4	74.08	69.06	
Year average	79.39	57.34	45.40	65.38	57.19	47.26	52.30	70.99	115.0	88.51	74.36	

Note (1): Jan. 1979 - Dec. 1988 LME cash price for 99.5% purity ingot
As of Jan. 1989 LME cash price for 99.7% purity ingot

Source: Metals Week

III.6 Cost of Production

Smelter operating cost estimates listed in table 5 below, clearly show that these have increased over the past months for almost all companies. In an environment of weakening alumina and ingot prices the opposite would have been more plausible, since it is expected that a lower metal price results in lower metal-indexed power charges at certain smelters. However, such indexation of power costs to the price of metal only applies to certain smelters in North America (BPA, TVA and Quebec area) and partly in Ghana (1). Some other smelters in regions such as Europe, Brazil and Australia (Portland smelter) receive their power at concessional rates.

Therefore, the main explanation for these smelters cost increases are:

(1) the effect of the reopening during 1990 of some high-cost potlines;

(2) the overall effect of inflation on "other" inputs primarily caused by the temporary increase of oil prices around August last year;

(3) the effect of the low value of the U.S. dollar on dollar denominated costs at primarily the European smelters.

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(1) In the U.S.A. some 45% of smelting capacity is supplied under variable power agreements

Table 5

Operating Cost of Aluminium Smelters
(January 1990 and January 1991)

Company/Country	Estimated O.C. Jan. 1990 (c/lb)	Estimated O.C. Jan. 1991 (c/lb)	% Change
Alcan	58	59	+ 1.7
Alcoa	59	62	+ 5.1
Alumax	61	61	0.0
Alusuisse	73	80	+ 9.6
Comalco	59	59	0.0
Hydro Al.	67	71	+ 6.0
Kaiser Tech.	68	67	- 1.5
Pechiney	63	66	+ 4.8
Reynolds	62	62	0.0
VAW	64	69	+ 7.8
Australia	54	55	+ 1.9
Brazil	55	64	+16.4
Canada	53	53	0.0
France	66	71	+ 7.6
Germany	71	77	+ 8.5
Italy	71	78	+ 9.9
Japan	55	58	+ 5.5
Norway	66	71	+ 7.6
Spain	68	75	+10.3
U.K.	59	66	+11.9
U.S.A.	65	66	+ 1.5
Venezuela	46	47	+ 2.2

Source: Anthony Bird Associates

The substantial cost increases experienced by the European companies, i.e. Alusuisse (+9.6%), Hydro Aluminium (+6.0%), VAW (7.8%) and Pechiney (+4.8%) whose smelter operations are concentrated in this part of the world are therefore no surprise.

The Secretariat estimates that the required price by the "average smelter" to cover these operating costs, capital charges, and earn a reasonable return on equity would be around 78.5 c/lb.

Under the current market prices, i.e. LME spot around 65-69 c/lb and company transaction prices at 71 c/lb many smelters are barely covering their operating and capital costs (i.e. total costs). This situation could ease up somewhat during the second half of the year in the event of a slight improvement in metal prices and a possible decline of alumina input costs. However, in the case of the U.S.A., certain proposed environmental regulations could mean additional costs at smelters.

IV. THE STATE OF THE ALUMINA MARKET

IV.1 Introduction

Despite increased requirements at smelters for metallurgical grade alumina (MGA), the market started to weaken by the second half of 1990, since supply exceeded demand. The end result of this supply/demand imbalance was the rise in alumina stocks by more than one million tonnes during the year. This situation has continued in the new year resulting in a downward pressure on alumina prices. While the short-term outlook for the MGA market is certainly not bullish, no distress sales are taking place. Thus, while the great times experienced by alumina suppliers in late 1988 and during 1989 are over for now, the depressed market situation of 1985/86 is certainly not envisaged at this time. The current softness of the alumina market is seen as a temporary market phenomenon which should start correcting itself by the end of the year, depending on the situation on the ingot market.

The longer term market outlook for MGA as seen by some industry analysts remains bearish to some extent, mainly because of fears that net exports to the Eastern countries may decline due to the inability of these countries to pay for the alumina. However, this sentiment is not shared by most executives of alumina producing and selling companies in the western world who feel that there is substantial scope for increased future supplies of this material to those countries.

IV.2 Production of Alumina

As shown in table 6, production of MGA in 1990 increased by some 1.3 million tonnes compared to 1989 output levels. The largest increase in production was recorded in Latin America (+848 kt) followed by Oceania (+366 kt).

It is of interest to note the jump in output during the second half of last year, when MGA production increased to 15704 kt from 15156 kt recorded in the first half of the year.

Production during the current year is expected to increase further by at least 1 million tonnes, a substantial proportion of which may be added to stocks.

Table 6

Estimated Regional Alumina Production in the Western World
1989-1990 (kt)

	Africa	North Amer.*	Latin Amer.*	East & S. Asia	Europe	Oceania	Total
1989							
MGA (I)	626	5129	6330	1623	5183	10668	29559
Non-MGA	-	813	317	870	1063	155	3218
Total	626	5942	6647	2493	6246	10823	32777
1990							
MGA (II)							
1st H	314	2622	3509	692	2590	5429	15156
2nd H	328	2642	3669	817	2643	5605	15704
Non-MGA							
1st H	-	418	114	432	563	98	1625
2nd H	-	366	113	460	551	98	1588
Total	642	6048	7405	2401	6347	11230	34073
(II)-(I)	16	135	848	-114	50	366	1301

Source: IPAI and IBA

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* Amer. = America

IV.3 Stocks of Alumina

Stock movements of MGA are set out in table 7 below. Expressed in days' consumption of MGA at western world aluminium smelters, today's stock levels are not too far from those at the beginning of the last decade. This is not a very encouraging sign. The Secretariat's analysis suggests that this situation will not improve in the current year. In fact, there are ample signs on the alumina market which indicate that MGA stock may increase this year by an additional 0.6-0.7 million tonnes. This precarious situation is expected to start improving in 1992 to some extent, with rising demand at greenfield non in-situ smelters such as Dunquerque, Alouette and Deschambault and at the many in-situ smelters in Brazil, Venezuela and Australia now undergoing brownfield expansions, while exports to the Eastern countries such as the U.S.S.R. and China are also expected to rise. This improvement on the MGA alumina market is not likely to suffer much from the brownfield expansions in the pipeline at alumina refineries in Latin America and Australia.

Table 7

Estimated Change in MGA Stocks in the Western World
1989-1991 (Q1 & Q2)

Quarter		MGA prod.(1)	Ingot prod.(2)	MGA equivalent (3)	Apparent change in MGA stocks	Total stocks MGA (4)
1989	Q1	6755	3563	6948	-193	4372
	Q2	7123	3620	7059	+ 64	4436
	Q3	7336	3640	7098	+238	4674
	Q4	7381	3641	7099	+282	4956
Total	1989	28595	14464	28204		
1990	Q1	7402	3583	6987	+415	5371
	Q2	7334	3608	7036	+298	5669
	Q3	7458	3668	7153	+305	5974
	Q4	7675	3734	7281	+394	6368
Total	1990	29869	14598	28457		
1991	Q1(E)	7705	3809	7428	+277	6645
	Q2(E)	7892	3885	7576	+316	6961

Source: Derived from IPAI and EAA data by IBA

Notes: (1) IPAI production including Yugoslav output less net exports to Eastern countries

(2) CRU data (incl. Yugoslavia)

(3) MGA consumption factor (1.95)

(4) End of year 1988 MGA stocks were 4565 kt.

(E) = IBA estimates

IV.4 Operating Costs

In retrospect, the temporary hike in the price of crude oil at the start of the Gulf crisis seems to have had minimal effects on the operating cost at most alumina refineries. Only those entirely run on fuel energy such as the refineries in Jamaica saw a temporary increase in their costs, stemming from increased oil prices. One major reason for this relatively mild effect on alumina cost was the fact that prices of bunker C oil lagged behind those of crude oil. Thus, bunker C prices did not move in tandem with the price of crude, and in fact remained relatively low.

As shown in table 8, operating costs in Q4 1990 increased very marginally compared to those in the third quarter, and actually declined slightly in the case of Australia where the refineries are now less dependent on imported oil and also because of a weaker Australian currency. The marginal increase in costs during the first quarter of the current year is based on a slight strengthening of the Australian dollar vis-á-vis the U.S. currency.

Costs at other refineries are also expected to increase somewhat in the first quarter due to the increase in the price of caustic soda which may be only partly offset by slightly lower oil prices.

Table 8

Prices and Operating Costs of Alumina 1989-1991
Q1 (US$/t)

	Average Operating cost (US$/t) W.W.	Australia	Average contract price (FOB)	Spot price (FOB)	Spot/LME (%) (1)
1989	149	135	258	544	28.4
Q1	150	135		633	28.9
Q2	148	131		600	29.8
Q3	148	134		483	27.6
Q4	149	139		458	26.9
1990	155	136	270	293	18.0
Q1	151	140		400	26.2
Q2	150	131		310	19.9
Q3	158	136		243	13.5
Q4	160	135		220	13.3
1991 Q1(E)	164	136	225-250	190-200	12.9

(E) IBA estimates

(1) Spot price of alumina as percentage of the 3-months forward quote for primary aluminium on the LME

Source: IBA Secretariat and J.F. King

The caustic soda input cost seems to have become a major problem for many alumina refineries which depend on outside sources for their supplies of this chemical. Thus, the spot price has increased from around $290/tonne (FOB) in Q4 1989 to $355/tonne (FOB) in Q4 1990, while contract prices have increased

from $255/tonne (FOB) to $280/tonne (FOB) over the same period (1). Contract prices have increased by some $10/tonne during the first two months of the current year. Spot prices have hovered around the Q4 1990 price levels.

These increases in prices were not only the result of the uncertainties on the oil market, but basically because of capacity limitations in the chlore-alkali industry (2).

IV.5 Prices

The overall development on the world alumina market during 1990 was influenced by increasing stock levels. Spot prices therefore declined from a high of US$400/tonne at the beginning of the year to a low of US$220/tonne by the end of 1990 (see table 8).

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(1) In 1985, caustic soda was sold at prices as low as US$50/tonne FOB in the U.S. Gulf region.

(2) Because of strict environmental regulations in the USA and Western Europe, the chlore-alkali industry has been hampered in its capacity expansion programmes. Demand for the co-product chlorine is also sluggish because of the environmental concerns, resulting in higher prices being charged for caustic soda.

The position of the contract market was somewhat different. The average FOB export price of the largest alumina exporter namely Australia, actually increased by some US$20/tonne in 1990 compared to the 1989 average despite the increasing supply/demand imbalance on the market.

This increase of the Australian export-price was mainly the result of lag effects of market developments on the contract price of alumina. Thus, the high metal and alumina prices during 1989 had a boosting effect on the average Australian price. This resulted in higher CIF prices for material imported into the U.S.A. as well, and the average world CIF price as shown in table 13 was therefore also higher in 1990 compared to the 1989 average.

However, while long-term contract prices increased during 1990, the situation was quite different for one year or short-term contract prices. These declined from some $360/tonne at the beginning of the year to around $225/tonne by the end. Such short-term contract prices are likely to follow trends on the spot market as they are partly related to this market and usually indexed to the LME metal price.

V. THE STATE OF THE BAUXITE MARKET

V.1 Recent Developments

Due to increased output at certain bauxite mines such as Trombetas and Los Pijiguaos the tight situation on the bauxite market prevailing in 1989 seems to have eased somewhat during the second half of 1990. During the first half of the current year, the market for internationally traded bauxite is expected to be well balanced but later in the year some softening could occur due to further increases in production in Guyana, Brazil and Venezuela.

In Guyana, shipments of bauxite from the Aroaima mine started early this year; a month or two later than originally planned, due to heavy rainfall. The mine is expected to produce 1.5 million tonnes of very good quality trihydrate bauxite this year. The Secretariat understands that Reynolds, the co-owner of the mine, has signed a long-term delivery contract with Marc Rich.

In Suriname, the Moengo mine is expected to be depleted by the end of July this year. The new Coermotibo mine will become operational around that time and start supplying bauxite to the alumina refinery in Paranam. The deposits in the Coermotibo area are large enough to last 10-12 years before they

too are depleted. Meanwhile, work is in progress to open the new Accaribo mine, which is expected to become operational in 1992.

In Brazil, output at the Trombetas mine reached 8 million tonnes in 1990 and is expected to remain around that level this year. Some 62% of the output in 1990 was shipped within the region, equally divided between Alumar and Interalumina refineries in Brazil and Venezuela respectively.

Production at the Los Pijiguaos mine in Venezuela amounted to some 1000 kt in 1990. Output should reach at least 1.5 million tonnes in the current year as the infrastructural facilities are nearing completion. If the target level of production is reached this year, some small amounts of Trombetas bauxite could be replaced by Los Pijiguaos bauxite at the Interalumina refinery. This process will continue in the coming few years until Venezuela becomes entirely self-sufficient in bauxite (1).

From the point of view of bauxite exporters, some rather disturbing news is the decision by Alcoa and Billiton to go ahead with the development of their bauxite deposit in

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(1) Some bauxite from Sierra Leone may continue to be required to sweeten the local bauxite. It is understood that Sieromco bauxite is currently purchased for this purpose at a premium price from Alusuisse

Oroximina, Brazil. In principle, this new venture should be operational by late 1992, with an initial output of 2.2 million tonnes per year, to be mined by a new company called Alcoa Billiton Mineracao (60% Alcoa and 40% Billiton). The IBA Secretariat understands that Billiton will be the operator of the mine and that later in the decade, output will be increased as the expansion of the Alumar refinery - where the Oroximina bauxite will be processed - is put in place.

It may be noted that with the replacement of Trombetas bauxite at Alumar and at Interalumina, around 60% of that bauxite, or some 4.8 million tonnes, will have to find other markets by the second half of the decade. Even if the Alunorte refinery in Brazil is completed by then, there will be some excess bauxite available on the international market, as no new non in-situ refinery capacity is in the pipeline. The bauxite market could therefore become weaker around that time.

V.2 Production

Preliminary data show that total bauxite production in the world was substantially higher in 1990 compared to 1989 output. As can be seen in table 9, western world production rose by 5% with highest increases recorded in Asia and Latin America while output in the Eastern countries was 3.2% higher in 1990.

In the current year, production in the Eastern Countries could decline as uneconomic mines in the U.S.S.R. and Hungary are closed. Output in the western world will increase with higher levels expected in Latin America (Brazil, Venezuela, Guyana), Caribbean (Jamaica) and Oceania (Australia).

Table 9

Estimated Bauxite Production 1989, 1990
(kt, regional basis)

Region	1989	1990	% Change
North America	744	558	- 25%
Latin America	24769	27314	+10.3%
Europe	7122	6816	- 4.3%
Africa	19402	19805	+ 2.1%
Asia	5664	6317	+11.5%
Oceania	41938	43762	+ 4.3%
Western World	99639	104572	+ 5%
Eastern Countries	12097	12484	+ 3.2%
Total World	111736	117056	+ 4.8%

Source: J.F. King, World Capacity and Market Report, February 1991

V.3 Prices

While most bauxite prices remained relatively high during the first half of 1990, substantial declines on the "spot market" were noticeable by the end of that year. Contract prices remained stable as can be seen in table 10.

The spot price of Boke bauxite was almost US$50/tonne FOB early last year, but has now declined to around US$34/tonne while Trombetas spot has declined from $49.50/tonne to $32/tonne over the same period.

The IBA Secretariat has been informed that the contract price of Trombetas bauxite has remained at $28.50 FOB for all customers, while negotiations are in progress to review this price. CVRD's position is that the price should go up by at least US$3-5/tonne whereas the other MRN partners are arguing for an actual price reduction. The Secretariat feels that under the current market conditions and the outlook for the remainder of the year, parties will agree to keep the price at the current $28.50/tonne FOB for this year and perhaps even for 1992. In any event, a price increase is not very likely.

While the Boke contract price has remained stable at $33/tonne FOB during 1990, this price is likely to decline to some extent in the current year, on account of lower ingot and alumina prices in 1990 compared to 1989 prices, and their impact on the pricing formula. The Boke contract price is expected to remain under pressure this year and even in 1992, when a new round of negotiations can be expected to revise the basic agreement which expires in July 1995.

In Sierra Leone, the government is seriously pursuing its negotiations with Sieromco, in order to obtain a better base price for this bauxite which will affect profitability of the operations and improve government earnings. The IBA Secretariat believes that the government will be successful in this undertaking.

Table 10

Estimated Price for Traded Bauxites
(FOB, US$/tonne)

	1989	1990			1991
	H2	H1	Q3	Q4	Jan./Feb.
Spot Price					
Boke	42	49.5	42	35.75	34
Trombetas	35	49.5	37.5	33.25	32
Contract Price:					
Boke	34	33	33	33	33
Trombetas	28.5	28.5	28.5	28.5	28.5
Gove	15	18	19.5	19.5	19.5
Weipa	14.5	17.5	19	19	19
Guymine	25	27.5	27.5	27.5	27.5
Sieromco	20	21.50	21.50	21.50	21.50
KJBC (Jamaica)	25	26.58	26.58	26.58	26.58

Source: CRU and IBA estimates

VI. SHORT-TERM FORECASTS

VI.1 Primary Aluminium

All indications point in the direction of very sluggish demand for ingot during the first two quarters of the year with some possibilities of initial improvements during the second half. Much will depend on the speed and force of economic recovery in the industrialised world.

The IBA Secretariat expects western world consumption for the year to remain close to 1990 consumption levels, and to improve in 1992 assuming a strong worldwide economic recovery by that time.

The current slump in demand for the metal will result in stock build-ups which currently are still at historically low levels. This means that prices should not come under further pressure this year and are likely to average around 70 c/lb for the year, improving to around 75 c/lb during 1992 (in nominal terms).

A more robust price improvement is not likely in the short term, since substantial amounts of greenfield and brownfield capacity have been commissioned since the second half of last year while very few cutbacks have been announced. Despite the relatively low metal price, producers have continued to produce at or above nameplate capacity. Although operating

rates at some smelters may be lowered in the course of the year as prices remain unattractive, no large closures are expected. Besides, lower alumina and energy charges may keep smelters in business despite a soft market for the metal. Thus, as can be seen in table 11, the Secretariat expects production to exceed consumption this year by at least 310 kt, but to be slightly lower than demand in 1992.

Table 11

Forecasts of Primary Aluminium Consumption and Production
(western world, 1991-1992 in kt)

Forecast by:		1990 (estimates)	1991	1992
IBA Secretariat	C	14650	14660	15250
	P	14570	14970	15200
Consultant I	C	14755	14762	15403
	P	14555	14714	14963
Consultant II	C	14722	14518	NA
	P	14562	15046	NA
Consultant III	C	14207	14593	15213
	P	14531	14895	15240
Consultant IV	C	14725	15250	15700
	P	14500	15850	15450
Consultant V	C	14803	14872	15643
	P	14581	15010	15428

One factor to keep in mind though is the possible increased inflow of Soviet metal to the western world markets. There are ample reasons to believe that this could happen in the medium term, resulting in an extended required time before the market improves. Despite the many technical and environmental problems faced by the Soviet smelters, supplies of metal to the western countries could be raised for the following reasons:

(1) the depressed national market;

(2) the freeing of metal due to the secession of barter-based arrangements between ex-Comecon member states;

(3) the need to earn hard currency.

In any event, the short-term outlook of the primary aluminium market is certainly not bullish.

VI.2 Metallurgical Grade Alumina

The rising gap between supply and demand for MGA since the second half of last year has resulted in increasing stock levels and declining spot prices.

This situation is expected to continue in the current year with stocks rising by another 600-700 kt. While there seems

to be some need to replenish MGA stocks at smelter sites, many such smelters are currently not in a financial position to do so. While the integrated smelters can operate with very low levels of alumina stocks this is less possible for the so-called independent smelters. In any event stocks are increasing and currently some small amounts of spot material is available at prices below US$195/tonne. The theoretical operating rate at western world refineries is currently estimated at 92 per cent (see table 12).

Table 12

Actual and Forecasts MGA Requirement
1990-1992 (kt)

Year	Primary aluminium production	MGA requirement	MGA requirement + net exports to Eastern countries	MGA capacity (4)	% utilization rate
1990	14570	28412 (1)	30860 (2)	32237	95.7
1991	14970	29192	30392 (3)	33002	92.0(5)
1992	15200	29640	30860 (3)	33527	92.1(5)

Note: (1) Primary aluminium production x 1.95
(2) Actual MGA production in western world
(3) Net exports to Eastern countries estimated at 1200 in 1991 and 1220 in 1992
(4) Estimated start of year capacity
(5) Theoretical utilization rate

Some industry observers argue that if no cuts are realized this year in operating rates at existing refineries, spot prices may reach as low as $150/tonne. However, the IBA Secretariat expects that based on this bearish outlook, some of the brownfield expansions in Australia (Wagerup, Worsley, QAL) and in Latin America (Interalumina, Alumar, Jamalco) will be slowed down somewhat in order not to depress the market further down the road.

Based on this assumption, the IBA Secretariat argues that the alumina market will not experience any distress sales this year and that next year should show some signs of improvement. By that time, lower operating cost due to relatively low oil prices, should enable alumina refineries to enhance their financial position.

VI.3 Bauxite

Currently the market for internationally traded bauxite is in fairly good shape. However, because of additional output being realized in Brazil, Guyana and Venezuela, this market could begin to experience some signs of weakness during the second half of the year. Apart from the impact of this additional supply on the market, there is also the effect of a lower base formula

price of Boke bauxite, due to the lower aluminium and alumina prices in 1990 compared to prices in 1989.

While the outlook is not bearish, more and more Trombetas or other bauxites being replaced at the Interalumina refinery will become available on the world market and will serve as a damper on bauxite prices. The bauxite market is therefore likely to remain relatively soft in 1992 as well, and prices to be under pressure also because of the expectations that the base contract price of Boke bauxite in that year will be lower than that in the current year, since alumina and metal prices this year will be below those realized in 1990.